

12 ■ Leibniz, an Introduction

I

Leibniz was born in 1646, four years before Descartes' death. He died in 1716, eight years before Kant's birth. His is the age of Louis XIV, of Oliver Cromwell and of William and Mary, the age of the wig and of instrumental polyphony. Among his illustrious contemporaries — and he knew quite a few of them personally — are Boyle, Huygens, Newton, Hobbes, Pascal, Spinoza, Locke, Malebranche, the great theologians Arnauld and Bossuet, the mathematicians Fermat, Roberval, Wallis, Barrow, Jacob and Johann Bernoulli, the zoologists Malpighi, Leeuwenhoek, Swammerdam, Ludwig von Ham, and furthermore Milton, Corneille, Racine, Molière, Swift, Bayle and Vico. It is not easy to put an appropriate label on Leibniz in this array of famous men and their respective muses. Leibniz composed, with few exceptions, only short summarizing or polemical essays, articles, memoranda, but his correspondence was immense. He is as much a mathematician as he is a physicist, a philosopher, a theologian, an historian, a jurist and even a diplomat, not to forget his official position of librarian.

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But this much can be said with some safety: to talk about Leibniz means to face squarely what is otherwise known as the "Quarrel of the Ancients and the Moderns." Leibniz's scientific and philosophical activities amount to an attempt to compose this quarrel by a compromise—a titanic compromise, to be sure—and all I can do is to show in what this compromise consists. Let us not forget, by the way, that just as there were plenty of "ancients" among the "moderns," so there were quite a few "moderns" among the "ancients." And let me also note, in anticipation of what I have to show later on, that Leibniz remains altogether "modern," that indeed in studying him one can discover the very roots of our own views which we are inclined to take for granted, that is to say, the very roots of our pre-judgements, of our prejudices.

Let us hear Leibniz himself. In a letter¹ towards the end of his life (1714) he says: "When I left the School of Trivial Arts [it is called High School today] I turned to the modern thinkers, and I remember taking a lonely walk in a little wood near Leipzig, by the name of Valley of the Roses, at the age of fifteen, to deliberate whether I should keep the Substantial Forms [he means the Aristotelian εἶδη or "forms" as taught by the Schoolmen]. The mechanistic doctrine prevailed and led me to the study of Mathematics. True, I embarked upon the study of highest Mathematics only after my conversation with Mr. Huygens in Paris. But searching for the ultimate foundations of the mechanistic view and even of the laws of motion, I was much surprised to discover that it was impossible to find them in Mathematics and that one had to go back to Metaphysics." As to the Formalists and Mechanists, he says a little later on: "I flatter myself to have discovered the Harmony between their different realms and to have understood that *both* sides are right, provided they do not impinge upon each other; that everything in natural phenomena occurs simultaneously in a mechanical and in a metaphysical way, but that the source of the mechanics is to be found in metaphysics. It was not easy to discover this mystery because there are few people who care to join these two kinds of studies."

1. Letter to Nicolas Rémond.

What does Leibniz mean by "Metaphysics," "ancient" metaphysics, that is, and what by the "modern" "mechanistic view"?

Let us consider "Metaphysics" first. Τὰ μετὰ τὰ φυσικά is the common title given to a series of books in the collection of Aristotelian writings that have come down to us. The text itself never uses this phrase. It means literally "those things which come *after* the consideration of things natural." By an almost legitimate misinterpretation the title came to mean a discipline which transcends the realm of natural changes and occurrences, which reaches *beyond* our direct experience. For Aristotle himself and the tradition which follows him the subject of this discipline has a twofold aspect: under consideration is first of all not any particular being or kind of being as, for example, man, horse, oak, gold, but rather what is *meant* whenever any of these things is said to *be* or to *exist*, what is meant by Being *itself*, by being *as* being; and secondly, after this prior question has been settled, *what* it is that can be said truthfully and strictly to *be* or to *exist*. In speaking of *metaphysical* considerations Leibniz follows this tradition and also stays within the bounds of the traditional terminology, especially in that he clings to the unfortunate rendering of "being," in Greek οὐσία, by "substance." Thus, for Leibniz, Metaphysics deals with the following questions: 1) What characterizes "substance"? 2) What can be said to be a *substance*? and 3) What is that of which "substance" *cannot* be predicated? We shall see, however, that, in answering these questions, Leibniz deviates from the tradition in a significant way.

What now does Leibniz mean by the "mechanistic view"?

He means primarily the opinions of Descartes concerning motion, and also those of Gassendi who revived the "atomistic" doctrines of Democritus, Epicurus, and Lucretius, concerning the composition of the universe. He means especially the view that all events and situations in the visible world around us can be reduced to mutual impacts of bodies, involving merely the following factors: the bulk (and shape) of the bodies themselves, their velocities, and the time and space in which their motions occur. According to Descartes² the fundamental and primary rule which governs all mutual impacts—and which follows

2. *Principles of Philosophy*, II, 36.

directly from the immutability of God—is the preservation of the “quantity of motion” in the entire universe, which, in more modern mathematical terms, amounts to saying that the sum total of the products of all m ’s and all v ’s in the world is the same for any given moment of time. Three secondary rules or *natural laws* determine, according to Descartes,³ all particular changes in the universe: 1) anything simple and indivisible remains by itself in the state it is in and changes its status only from external causes; 2) any part of matter—that is, any part of what Descartes calls the “extended being”—whenever in motion moves by itself in a straight line;⁴ 3) if a body A collides with another body B which has a *stronger* tendency than the first to persevere in its rectilinear course, the body A preserves its quantity of motion but changes its direction; if a body A has a *stronger* tendency than the body B to persevere in its rectilinear course, the body A transmits to the body B as much motion as it itself loses.⁵ Implicit in these laws is a notion of “force” as identified with the product mv , that is, with the “quantity of motion” or, as we call it today, with the “momentum” of the moving body, which is responsible for imparting motion to another body or for resisting the impact of another body.

All this provides the pattern for what Leibniz calls the “mechanistic view.” It cannot be made explicit without mathematical formulae. Leibniz holds that this mechanical and mathematical pattern is quite appropriate for dealing with the problem of motion. But he corrects Descartes’ fundamental rule of motion as well as Descartes’ notion of force in a decisive way, as we shall see. In doing that he transforms mechanics into dynamics.

II

We have heard Leibniz say that he succeeded in harmonizing meta-physical and mechanical considerations. What can har-

3. II, 37.

4. II, 39.

5. II, 40; cf. II, 43.

monizing mean in this case? Metaphysics presents us with the problem of Being — in Leibnizian terms, with the problem of the nature of "substance." Mechanics presents us with the problem of how to understand and how to describe motion of bodies and their mutual impact in the most appropriate way. Do these two things lend themselves to being "harmonized"? Is there any "quarrel" between them? Are they not totally disparate — not so much inimical to each other as indifferent to each other? Yet Leibniz undertook to bring them together. To do that he had to *construct* something new, something that has been called — by others as well as by himself — a "system." He keeps using these phrases: a "regulated system," a "new system," "my system."

The term "system" has a curious history. The Greek word σύστημα means "things which stand together or are made to stand together so as to form a whole," means in other words "a whole compounded of several parts," and is applied to man's body, to a government, a constitution, a confederacy, to groups of men or animals, to literary compositions, is used in the practice of arithmetic, of music, and of medicine, *but is never applied to thought*. From about the year 1600 on there is a sudden and most remarkable shift: book after book appears under titles like "System of Logic," "System of Rhetoric," "System of Grammar," "System of Theology," "System of Ethics and Politics," "System of Physics," "System of Jurisprudence," "System of Astronomy," of Arithmetic, of Geography, of Medicine and even "System of Systems." But it is due mainly to Leibniz that philosophizing becomes identified with the producing of "systems of philosophy." In a letter ⁶ written in 1715 Leibniz takes the opportunity to remark: "If some one were to reduce Plato to a system he would render a great service to mankind and one would be able to see that I am not very far from him." This pious wish has since been fulfilled far beyond anything Leibniz could have expected.

The harmonizing of Metaphysics and Mechanics requires the construction of a *System*, that is of a whole which encompasses and unites disparate parts. But such a work of art, such a construction, requires, in turn, *pillars* on which the system may

6. Letter to de Montmort.

securely rest. Leibniz erects *two* pillars which fulfill this function. One consists in a new characterization of Being or Substance. The other consists in a re-interpretation of Force. In both cases, though in a different way, Leibniz is helped by considerations derived from Mathematics, which very fact demands and indeed finds justification.

In the traditional view, based on Aristotle's teaching, whenever we say that *X* is, we mean implicitly that this *X* is a "*thing*," is "*something*," is "*one*," is "*true*," and is "*good*." These six modes of predication (*ens*, *res*, *aliquid*, *unum*, *verum*, *bonum*) are traditionally called the six "transcendentals," applicable interchangeably to anything to which we attribute being. All six are of prime importance to Leibniz, but most important to him is "oneness," "unity." True being—or, as we still say with so much ease, substantial being—must have the character of true unity, must be a genuine unit.⁷ Examples of units are provided in Mathematics. There are arithmetical units and geometrical units or points. But an arithmetical unit can be fractioned *ad infinitum*: $1/2$, $1/4$, $1/8$, $1/16$, and so forth. This divisibility seems to deprive the arithmetical unit of true unity. Leibniz does not think that it does: he thinks the fractions "within" an arithmetic unit are mere "possibilities," a term we shall have to return to after a while. But because the arithmetical unit allows itself to be interpreted as infinitely divisible, Leibniz prefers the geometrical example of a point. There is probably no one else to whom Euclid's First Definition in the *Elements*, that of a point, has meant so much as it has meant to Leibniz: "A point is that which has no parts." Leibniz is not altogether satisfied with this definition. He prefers this one: a point is that which has no extension.⁸ Its not being extended makes it "simple" and therefore truly one, that is, genuinely indivisible. In this respect, then, true being, "substance," must resemble a point. Substances are not geometrical points, to be sure, but they are "metaphysical points."

Yet Leibniz is not content with this characterization. He adds something to it, and it is this addition which constitutes his devia-

7. Fourth letter to Arnauld.

8. *The Theory of Abstract Motion: Fundamental Principles* (1761).

tion from traditional metaphysics. Substantial being must have not only true unity but also *uniqueness*. Whatever truly is must be unique. Unlike geometrical points, metaphysical points must differ from each other. This *principle of uniqueness*, then, is *the first pillar of the system*. It can be stated as follows: there are no two true beings that can be conceived as indistinguishable from each other.⁹ And this metaphysical truth may well, according to Leibniz, be verified in nature. (We shall see later, why.) There is a story about Leibniz taking a walk in a wood with ladies of the court he was attached to; the ladies pressed him to explain to them his great "principle of the identity of indistinguishables"; he suggested that they pluck leaves from the bushes and trees they were passing and try to find two identical ones; the ladies did not pass the test.

Implicit in the formulation of this principle of uniqueness is a corollary or twin principle. Being or Substance is *diversified*; Substance is by itself not singular, is not one substance (as Spinoza claims), but is plural, is *many*, and not only many but *infinitely many substances*, each one of which is one and unique. Here again a mathematical example illuminates Leibniz's thought: the metaphysical points form a *continuous series* similar to the continuum of geometrical points on a line. The twin principle, supplementing the principle of uniqueness, is the "*law of continuity*." It states that there are no "gaps" in the sequence of substances: "between" any two of them there are infinitely many others. This principle, too, can be verified in nature: all motions and changes are continuous, there is no "jumping" from one state into another. Nor is there any interruption in the chain of organic beings.

Thus Leibniz answers the first question of his Metaphysics, the question "what characterizes substance?" as follows: the fundamental characteristics of Being or Substance are Simplicity, Unity, Indivisibility, which make true being unchanging and imperishable, and furthermore, Uniqueness and Continuous Diversity.—We have to look now for his answer to the second metaphysical question: "*What can be said to be a substance?*"

9. Fifth letter to Clarke, 21-28; *Monadology* 9.

III

The foundation of his answer to this question is again to be found in Aristotle's teaching and the entire Aristotelian tradition. For Aristotle, to *be* means ultimately "to-be-at-work"—in Greek, ἐνεργεῖν. The noun ἐνέργεια is used by Aristotle almost synonymously with the noun ἐντελέχεια "being-at-one's-own-end," and Leibniz prefers the latter. These terms characterize, in Aristotle, Being itself (οὐσία) inasmuch as it is identified with νοεῖν or νοῦς, the divine source of all intellectual perceiving. In traditional terminology, Being itself is "act" or "activity," the activity of intellecting. Leibniz adheres to this teaching: Being or Substance, in its simplicity, unity, and indivisibility, is still "in act," is *active* being; the metaphysical points are, as he says, "fertile simplicities" (*des simplicités fécondes*).¹⁰ Leibniz modifies the traditional teaching only slightly: the activity, the ἐνέργεια or ἐντελέχεια, is given the generic name "*perception*." However, this slight modification is pregnant with massive consequences. Let us first understand what Leibniz means by "perception" in contradistinction to what this term usually conveys.

When we say that we *perceive* something we mean that there is something before us which we "take in," as it were, which we see, or hear, or touch, or smell, or taste. This something is nowadays called the *object* that affects us in some way. In pre-Leibnizian or rather pre-Cartesian times this something was called the *subject* of our perception, while the term "object" was reserved to its "image" or "concept," formed, as we say "within" us. In a larger sense, to "perceive" could also mean to apprehend something entirely unrelated to an external subject. In any case, that which presents itself to us "within" us was traditionally understood as something *thrown* at us—that's what the Latin term "*objectum*" literally means. In Leibniz's way of speaking, however, what is *perceived* by us is what *we ourselves throw out* of us and put *before* us—not an *ob-jectum* but a *pro-jectum*, as it were. Now, this act of pro-jecting is, according to Leibniz, the very activity of Being as such, of Substance. And it is *this* activity that Leibniz means when he speaks of "perceiving" or of "perception."—What being, we have to ask, is capable of such

10. Second treatise against Boyle.

activity? It is not implausible to answer: a *soul* or something resembling a soul. This indeed is the answer Leibniz gives to his second metaphysical question, "What can be said to be a substance?" The simple and indivisible metaphysical points must be souls or, at least, resemble souls.

But does not the activity of perceiving, which implies a multiplicity of perceptions, violate the unity of the metaphysical points? Leibniz does not think so. He defines: "The transient state which encompasses and *represents* a *multiplicity within the unity* or within the simple substance is no other than what is called perception"¹¹ Let us note the word "represent." It is a crucial term in the Leibnizian system and in subsequent philosophies. Perception is "representation." A perception *presents* to the simple and indivisible soul a multiplicity, a diversity of what? The prefix "re-" in the term "re-presentation" suggests the answer. Perceptions re-present all the perceiving activities of all the other souls or perceiving metaphysical points. What they present *stands for* all those activities of all the other souls. But these presentations or representations do not affect the unity of their source, the unity, that is, of any of the perceiving metaphysical points.

Perception and representation are synonyms in Leibniz. And to clarify their equivalence he uses still another synonym. Souls not only "perceive" and "re-present" but also "express." A representation is an expression. Leibniz defines: "A thing expresses another thing (in my way of speaking) when there is a constant and regulated relation between what can be said of the one and of the other,"¹² or, in a more modern way of speaking, when there is a one-to-one correspondence between the two. Thus the diversity and infinite multiplicity of all metaphysical points find their representation or expression in any one of them.

But the activity of perceiving, representing, or expressing must also leave inviolate the uniqueness of each metaphysical point. There is an intrinsic safeguard which prevents this uniqueness from being infringed upon. The activity of perceiving proceeds in each single case *from a unique "point of view,"* a phrase which Leibniz keeps repeating over and over again. This phrase

11. *Monadology* 14.

12. Fifth letter to Arnauld.

reveals indeed the full meaning of the term "metaphysical point." Each "point" is strictly a "point of view"—a unique source of viewing. And a geometrical point is but a peculiar "expression" of a "point of view."

IV

While discussing Perception, Representation, and Expression, we have already been dealing with the third question of Leibniz's Metaphysics, to wit: "What is that of which "substance" cannot be predicted?" For the answer is: it is *what* the souls or soul-like points perceive, namely the "representations" and "expressions" which have their source in the activity of those souls or points. We *do* understand that what is "perceived" by a single point are *not* the activities of all the other points but *merely* what *corresponds* to them, re-presents them, expresses them and what is *spontaneously* produced "within" and by that single, simple, indivisible, and unique metaphysical point. What is thus produced is the entire world of living and inanimate things which surround each of us. But what is thus produced—this entire familiar world of ours—has no true being, is not "substantial," is merely, as Leibniz does not tire of asserting, *phenomenal*. The world as we perceive it is *projected* by each of the metaphysical points, among which are also the human souls. The totality of the world around us is therefore not "real," has not the character of an existing thing or of existing things. It is altogether a *phenomenon*, a phenomenal world, an appearance—which does not mean an illusion or a phantom. The world as it appears to each of us, Leibniz keeps repeating, is a "*well-founded*" phenomenon—well-founded because it *corresponds precisely* to all the metaphysical points and their perceiving activities. The correspondence between the phenomenal world and substantial being cannot, of course, be equated, we well understand, with the correspondence which prevails between image and original. For the phenomenal world, which includes originals and their images, is determined by the *temporal* and *spatial* cohesion of all perceptions: space is nothing but the order by which phenomena appear to co-exist, time

nothing but the order that allows phenomena, which have no permanence but have some connection among themselves, to manifest this connection: substantial being, on the other hand, has no time and is in no space.¹³

It is the phenomenal world alone, according to Leibniz, that mechanistic philosophy or, as we should perhaps state more generally, mathematical physics tries to understand. This entirely legitimate undertaking can, however, Leibniz thinks, go one step further: it can reach a stage where the correspondence or harmony between the phenomenal world and true or "substantial" being may become mechanically manifest, and — one further step still — where the Mechanics may be seen to depend on Metaphysics. This happens when, in the science of motion, we consider the nature of Force. Descartes was mistaken, Leibniz thinks, in equating Force with the "quantity of motion," that is, with the product formed from the amount of matter in motion and its velocity (mv); this quantity is labelled by Leibniz a mere "derivative" force. Descartes was also mistaken, Leibniz thinks, in believing that (apart from its direction) the "quantity of motion" in the universe or, for that matter, in an isolated machine (even if we disregard friction) remains constant. Basing himself on Galileo's investigation of falling bodies, Leibniz shows that the proper measure of Force is the distance through which a body can lift itself upwards by the power acquired in its preceding free fall; and that consequently Force must be equated with the product of the body, i.e., its mass, and the square of its velocity (mv^2). He calls this Power or Force primordial, active, or "living force."¹⁴ Let us hear how he describes it: "By *force* or *power* I do not mean the potentiality or mere capacity which is nothing but a possibility of future action and which, being dead, as it were, never produces any action without being prompted from the outside; I mean rather a mean between potentiality and action, something that implies an effort, an act, an entelechy, for force *by itself* goes over to action provided it is not impeded by anything." What Leibniz describes in these

13. Second treatise against Boyle.

14. Cf. *On the Emendation of First Philosophy and the Notion of Substance* (1694).

words and represents by the product mv^2 is called today, curiously and significantly enough, *Energy*.¹⁵ For Leibniz himself it is the only "real" element in the phenomenon of motion; it is the one which is constantly preserved. In forming the product mv^2 we thus grasp symbolically the ἐνέργεια or, as Leibniz prefers to call it, the entelechy, the true activity behind the purely phenomenal. We understand thus more precisely why the phenomenal world can be called a well-founded phenomenon: the laws of Physics, the laws of Dynamics, are indeed rooted in the metaphysical realm, namely in Energy, in the activity of the simple, indivisible, "perceiving" souls or soul-like points.

This Force, then, is the *second pillar of Leibniz's system*. It is that because it points to something which transcends the phenomenal world and provides a link between the time-and-space-ridden domain of Mechanics and the time-and-space-less domain of Metaphysics.

Let us not forget: the temporal and spatial world is a creation of each of the infinitely many souls or soul-like points. Each of them has *within* itself a phenomenal world of its own making. How then can we have a common world in which we live, in which we act and are acted upon? This is the central problem of Leibniz's Metaphysics. Before we come to grips with it we have to consider once more and more fully what Leibniz calls "perception."

V

Not only does the perceiving of each of the souls or soul-like beings constitute a unique point of view or, better, a unique point of viewing, but the perceiving itself has infinitely many *degrees*. The law of continuity holds here, too. Perceptions can be *obscure*, which means that they hardly project anything perceivable. Leibniz's standing example is the way in which the waves of the sea affect our hearing: we can hear their roaring but we do not discern the noise each single wave produces, though it undoubtedly reaches our ears. Leibniz has a special

15. First treatise against Boyle; *Monadology* 18.

name for the obscure or imperceptible perceptions. He calls them "little perceptions."¹⁶ Perceptions can be *clear*, but either confusedly or distinctly so. An example of a clear, yet *confused* perception is provided by the way in which we see a painting that either pleases or offends us, although we are not able to say what particular features make it pleasant or offensive. A *distinct* perception is one which enables us to distinguish and to enumerate the details it presents. But again a distinct perception can be either inadequate or adequate. It is *inadequate*—or "symbolic"—when the enumeration of the details remains incomplete, as for example when we imagine a figure of one thousand sides; it is *adequate*—or "intuitive"—when *all* the details are *at once* clearly, distinctly, and completely perceived. Moreover, although *any* perceiving is the very *activity* which characterizes Being, that which is perceived may have either an active or a passive character. Striking a blow, for example, is equivalent, as far as the striker is concerned, to an *active* perception; being attacked by somebody is equivalent, as far as the victim is concerned, to a *passive* one.

This classification of degrees and kinds of perception is itself an inadequate one, for it does not take into account the infinitely many intermediate stages between them. But it enables Leibniz to discriminate between three great groupings among the infinitely many perceiving points. These groupings merge into each other so as to produce borderline cases, but are still sufficiently distinguishable from each other.

Perceiving which projects entirely passive and completely confused perceptions (and should be called, according to Leibniz, *sensing* rather than perceiving) determines the domain *not* of soul, but of soul-like being, to which, in the phenomenal world, correspond what we call *inanimate* or *material things*. It is indeed passivity or "inertia" which, according to Leibniz, characterizes what we call "matter." Any other perceiving (which includes retention) determines the domain of soul, to which, in the phenomenal world, correspond *plants* (Leibniz is not entirely sure about that), *animals* and *men*. But perceiving can reach such a degree of distinctness and attentiveness as to turn

16. *Discourse on Metaphysics* 24; *Meditationes de cognitione, veritate et ideis* (1684).

upon itself and become "reflexive." A perception which is thus reflexively expanded and compounded is called by Leibniz "*apperception*" (derived probably from the French "*apercevoir*" or "*s'apercevoir*"). Only the souls of men (and of angels) are capable of *apperception* and bear, therefore, a special name; they are called "*spirits*." To designate *all* metaphysical points by a common appellation Leibniz uses the term "*monad*," from the Greek *μονάς*, meaning unit. But the distinctions he introduces among the monads are crucial. Let us hear Leibniz himself: "... it is well to distinguish between *perception* which is the *inner state* of the monad and which represents the external things and *apperception* which is consciousness or the reflexive cognition of that inner state and which is not given to all souls and not even to one and the same soul all the time."¹⁷ This reflexive cognition involves above all the perception of the perception's source, in other words, the perception of that which the pronoun "I" is meant to convey. While, on the other pole, the monads whose perceptions have an altogether passive and confused character are monads in a dead faint, as it were, or, as Leibniz also says, "completely bare monads."

VI

We can now revert to the central problem of Leibniz's Metaphysics. Given the uniqueness of each monad and the creation within each of a phenomenal world from its unique point of view, how can there be a *common* world familiar to all of us? The answer given by Leibniz is *the coping-stone of his system*. The commonness of our common phenomenal world is the result of the *Harmony* which God, the all-comprising monad, imposed upon the perceiving activities of all the infinitely many created monads at the moment of their creation. Let us understand what this means.

At this very moment, I, as a monad, have produced a series of perceptions which present to me this room with its light and its peculiar dimensions and with all of you sitting in your seats

17. *The Principles of Nature and Grace, Based on Reason* 4.

and listening — or attempting to listen — to me. Each one of you, as a unique monad, has at the very same moment produced a series of perceptions which present to each of you this room with all its furniture, its light and sound, with all the other people seated in rows around you and with a man standing at the lectern lecturing to you. Metaphysically speaking our monads have *no connection whatever* with each other: "monads have no windows," as Leibniz says. Each of our monads is totally isolated from all the other monads. Yet, thanks to the *pre-established harmony* among all the monads and their respective perceptions, the perceptions of each of our monads are in step, so to speak, with the perceptions of all the others. The experience which we share in common is not only purely phenomenal, though well-founded, but depends altogether on our being wound up in a matching way. The spatial and temporal character of this experience is the spatial and temporal character of each of the phenomenal worlds produced by each of the monads from its unique point of view. But all these individual phenomenal worlds match perfectly with each other. Therefore the mechanism by which the sound waves phenomenally emanate from my vocal chords and phenomenally reach your ears can be dealt with on purely physical and mathematical grounds. More generally, the pre-established harmony permits mathematical physics to be a *common* enterprise. Not only do the diversity and infinite multiplicity of all monads find their representation and expression in any one of them, but there is also complete correspondence between the monads' phenomenally common experience of the phenomenon "Nature" on the one hand and its metaphysical foundation on the other. That is why metaphysical principles, like the principle of uniqueness and the law of continuity, can be verified in nature and dealt with mathematically. His system, Leibniz remarks, makes us understand "that bodies act as if (to argue the impossible) there were no souls and that souls act as if there were no bodies and that both act as if one influenced the other."¹⁸

Let us look at this breath-taking spectacle in a larger perspective. I, being a monad and speaking here as a phenomenon,

18. *Monadology* 81.

represent right now within me not only what all of you in this room severally represent within yourselves at this very moment; I also represent within me the *entire* world of phenomena, that is to say, the perceptions of *all* the infinitely many monads of the universe. Whatever may — phenomenally — happen in the Congo, for instance, at this moment, or, for that matter, on a distant planet, has its counterpart, its corresponding perception in me. Each monad "mirrors," as Leibniz says, the entire universe. Each monad is a microcosm. But *no* monad — no created monad, that is — is *aware* of this immensity within it. Only a tiny portion of all its perceptions reach the stage of clear and distinct perceptions. The overwhelming majority of them do not reach the plateau of consciousness. As far as perceptions are concerned, we are — iceberg-like — submerged in the depths of passivity and confusion. We are *limited*. Our limits are circumscribed by what we call our bodies, which are nothing but the phenomenal expressions of monads closest to us.

What a phantasmagoric spectacle! one is inevitably led to exclaim. What a system, or rather what a systematic monstrosity! Leibniz seems quite aware of the revulsion (mingled, I think, with some admiration) which his system is bound to provoke. His reply is that his system preserves and unites the thoughts of all preceding generations about man, universe, and God; that previous philosophies show much more agreement than one is led to believe when neglecting the core of their insights, which constitutes what he calls the "perennial philosophy" (*philosophia perennis*); that the revulsion against his system stems above all from an underestimation of divine wisdom; that his doctrine of "pre-established harmony" is the best proof of God's existence, power, providence, and omniscience. He does not claim that he looks at the universe from the throne of God. He has only been admitted — and he invites us to follow him — to the audience-chamber of God. We might say, using phenomenal terms metaphorically too, that he, Leibniz, is seated on a little stool at God's feet. But we cannot help adding: Is this the proper seat for the philosopher?

God, according to Leibniz and according to the tradition as well, is not limited in his vision. In Leibnizian terms, the perceptions of the primordial and all-comprehensive monad are not encumbered by any passivity and confusion. God sees

everything at once, adequately and intuitively. The cohesion of his perceptions is neither temporal nor spatial. He sees in one sweep all the monads *from the outside*, as it were, including the entire sequence of their inward perceptions. He sees, for example, that the monad named Julius Caesar includes his crossing the Rubicon or that the monad named John Smith includes his visiting his aunt on September 8, 1672. This means, in philosophical language, that anything predicable of a subject is contained in that subject, although we human beings, as limited monads, are in general unable to extract the predicates from the subject, are unable to deduce them *a priori*. Everything in this world is thus eternally known to God and appears therefore predestined. The grave problem of all Christian theology, how to reconcile human freedom with divine predestination, remains a problem for Leibniz, too.

But Leibniz has a great deal to say about the way this predestination is arrived at.

One has to distinguish sharply, says Leibniz, between what is *certain* and what is *necessary*. Necessary — that is, absolutely necessary — is that, the denial of which is *self-contradictory*. Certain is that which actually occurs, although its not occurring would *not* involve any self-contradiction. Accordingly, there are two kinds of truth: the *eternal verities*, as for example those of Mathematics, and the *verities of fact* which are not necessary but contingent. The first ones, the eternal verities, are governed by the *principle of contradiction*, and their source is ultimately God's reason. The second ones, the contingent verities, are governed by the *principle of sufficient or determining reason*, and their source is ultimately God's will. The first ones delimit what is merely *possible*, the second ones determine what actually *is*, what actually *exists*, that is to say, all the monads with their perceiving activities.

God, thinking all that is thinkable, in other words, everything which is not self-contradictory, seeing all *possibilities* which offer themselves to his reason, decides which of these possibilities have to be actualized, have to be made "real" in fact. In making this decision he applies the *rule of goodness or benevolence* so as to choose *the best among all the possible worlds*. The *best* is the sufficient and the *only* sufficient or determining reason for the existence of the world as it is: God wills the best and his

power puts it into being. The best, in Leibniz's understanding, is the greatest possible diversity among the monads coupled with their uniqueness and governed by the least number of principles. Evil arises inevitably in this best of all possible worlds because of the limitations imposed on the monads by the very fact of their uniqueness and their diversity. These infinitely varied limitations make all created monads *imperfect*, deprive them of the perfection they *might* have but *cannot* have within the metaphysical continuum they belong to by the will of God. But these limitations do not deprive them of *perfectibility*: "everything, when it exerts its efficacy or power, that is to say, when it *acts*, changes into something better and expands in proportion to its action."¹⁹ The world as a whole, therefore, tends to progress.

The world, then, under the rule of divine benevolence, is purposefully organized, is governed — metaphysically — by *final causes*. We need not, however, consider any final causation when we investigate the phenomenon Nature. Whatever *efficient causation* we discover in natural changes and motions will automatically reflect the purposeful metaphysical order of being. Thus Leibniz can say: "Souls act according to the laws of final causation by appetitions, ends and means. Bodies act according to the laws of efficient causation, in other words, according to the laws of motion. And the two realms, that of efficient causes and that of final causes, are in harmony with each other."²⁰

There is a potent link between the two, willed by God and accessible to human understanding. This link is the domain of *Mathematics*. It is especially for the entities of this domain that Leibniz reserves the appellation of "ideal" beings. Of this kind are arithmetical units and numbers, geometrical points, algebraic symbols, curves, tangents, infinitesimals, derivatives, integrals. They are "ideal" entities because they do not have metaphysical dignity since they lack "substantial" being or "reality." On the other hand, they are the result of perceptions which have reached, at the very least, the level of symbolic distinctness and which can, moreover, impart symbolic distinctness to

19. *Discourse on Metaphysics* 15.

20. *Monadology* 79.

the confused perceptions of natural phenomena. They belong to the domain of "eternal verities." Leibniz, as we know, discovered the *differential and integral calculus* in partial collaboration and fierce competition with Newton. It is this calculus which clarifies phenomena of change and motion, both terrestrial and celestial; and, again, it is due to mathematical considerations that we realize the true nature of Force and are brought thereby, as we have seen, to the very threshold of Metaphysics. Whence this power of Mathematics, and especially of Calculus, the abacus of infinitesimals? It seems that Leibniz understood the "ideal" symbolic medium in which Mathematics operates as provided by the order of co-existence and the order of succession, by space and time. Now, this temporal and this spatial order *combined* give to the phenomenal world presented to us by our perceptions its typical phenomenal character. And at the same time, it is only in temporal and spatial terms that we can get hold of the law of continuity, the adjunct of the principle of uniqueness, which law determines the structure of the entire metaphysical domain. That is why mathematical considerations and even mathematical terminology are not only justified but also necessary both in mechanistic and in metaphysical investigations.

In his earlier years, Leibniz planned to exploit the power of Mathematics to the full. His predecessors, notably Vieta and Descartes, impressed by the ancient idea of a "universal science," had sought and found this "universal science" in Algebra, which they interpreted as the general "analytical art." Leibniz went one step further. He planned a *new* "general science," a "universal characteristic," that is to say, a general symbolic calculus which would enable men to find *all* humanly attainable truth. This is the way he speaks of this "philosophical calculus": "If there were available either some exact language (which some call Adamic) or at least a kind of truly philosophical writing by means of which notions were to be reduced to an *alphabet of human thought*, everything deducible by reason from given premises could be found through a kind of computation, in the same way in which arithmetical or geometrical problems find their solution."²¹ The idea of such philosophical algebra presup-

21. *De scientia universali seu calculo philosophico* (c. 1684).

poses, as Leibniz explicitly states, the conviction, which he never abandoned, that all possible predicates are contained in their subject. The goal of this philosophical algebra would be the discovery of *all* eternal verities. It was not given to Leibniz to carry this plan into effect. It contains, in part, at least, the germ of what is known today as "symbolic logic."

VII

Let us look back for a moment with some detachment at what I have been trying to report about Leibniz's system, about his compromise between the "ancients" and the "moderns." Two incidental features of this system strike us as most remarkable.

The first is related to the distinction made by Leibniz between perception and apperception. It is only on the level of reflexive cognition, of consciousness, of apperception, that the problem of *error* arises. Leibniz himself says²² that our perceptions are always true, in accordance with the pre-established harmony of things, but that our *judgements* may be faulty and deceiving, for which, Leibniz claims, God is not to be blamed. Judgements are made by "spirits" on the level of apperception, on the level of consciousness. Yet judgements still belong to the perceiving activity which characterizes the very being of monads. Judgements cannot help, therefore, having a share in the harmony of the world, cannot help representing or expressing, or corresponding to, something which is external to the spirits that make those judgements. What, then, corresponds to faulty judgements — what, among all the other monads, corresponds to our errors? Does not the pre-established harmony of the universe break down in this case? It seems, at any rate, significant that Leibniz pays but little attention to the grave problem of error, and to its implications, which his predecessors never neglected.

The second remarkable feature of Leibniz's system is a curious reversal of the traditional relation between the inner and the outer aspects of souls. The contrast between the "inner

22. Cf. *Discourse on Metaphysics* 14.

man" and the "outer man," the latter being conditioned by external circumstances of birth, wealth, and reputation, is a recurrent theme dwelt on in philosophical reflexion. The "inner" dimension of the soul of man, the "looking into oneself" instead of "about oneself"—these are among the most solemn topics of all Platonic philosophizing. Most of you will remember the end of the *Phaedrus*, where Socrates is praying to Pan and to any other divinity that may have been present: "Grant me to become *inwardly* beautiful; grant me that all my external possessions be in harmony with those *within* me." Or let me quote Montaigne speaking from the other end of the spectrum, as it were: "That command issued in ancient times by that god in Delphi was a paradox. It said: Look into yourself, recognize yourself, hold on to yourself, lead back your spirit and will which expend themselves elsewhere; you are leaking, you are spilling over; stick to yourselves, support yourselves; you are betrayed, dissipated, robbed of yourselves. Don't you see that this world keeps all its viewing inside itself and its eyes open to contemplate itself?"²³ And Montaigne continues: "That [Delphic] god was saying: Except for thyself, O man, each thing applies itself first to itself and sets limits to its works and desires according to its needs. There is none as empty and needy as thyself who encloses the universe. Thou art the examiner without knowledge, the magistrate without jurisdiction, and—all in all—the clown in the farce."—How different is the emphasis in Leibniz! The monad, the soul, the spirit is *inwardly* filled, filled with the phenomenon of the *external* world. To reflect on this phenomenon means to step outside, to occupy the stool at God's feet, to direct one's metaphysical gaze on the inwardness of the soul from without. What inversion! The "inner" and the "outer" aspects of things seem to have exchanged places. It is this subtle exchange, this inversion, this reversal which makes Leibniz a "modern" thinker bent on extending immeasurably and, by the same token, on reducing irretrievably the inner dimension of the soul.

23. III, Ch. 9, end (*De la vérité*).